

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 05-090548

(43)Date of publication of application : 09.04.1993

(51)Int.Cl.

H01L 27/14

H01L 23/02

(21)Application number : 03-249677

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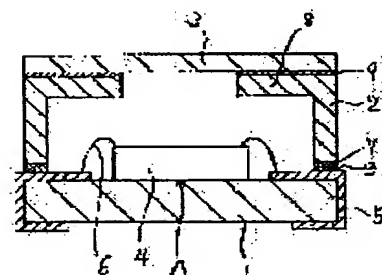
(22)Date of filing : 27.09.1991

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(54) PACKAGE FOR ACCOMMODATING SOLID-STATE IMAGE SENSING ELEMENT**(57)Abstract:**

PURPOSE: To obtain a package for accommodating a solid-state image sensing element at a low cost which can effectively prevent unnecessary light from entering the inside of the package, and make it possible for a solid-state image sensing element to generate excellent photoelectric conversion for a long term.

CONSTITUTION: An insulating substrate 1 is provided with a mounting part A on which a solid-state image sensing element 4 is mounted and a plurality of metallized wiring layers 5 which are stuck and led out from the upper surface to the bottom surface via side surfaces. An insulating frame body 2 which surrounds the mounting part A and prevents the solid-state image sensing element from being irradiated with unnecessary light is fixed on the insulating substrate, thereby constituting a package for accommodating a solid-state image sensing element. As to the metallized wiring layer 5 stuck on the surface of the insulating substrate 1, at least the part position where the insulating frame body 2 is fixed is coated with an insulating film composed of the essentially same material as the insulating substrate 1. The insulating frame body 2 is rigidly fixed on the insulating substrate 1, and effectively prevents unnecessary light from entering the inside of the package.

**LEGAL STATUS**

[Date of request for examination]

13.06.1997

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

2922682

[Date of registration]

30.04.1999

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] On the insulating base which has two or more metallizing wiring layers which a solid state image sensor applies to a base, and by which covering derivation was carried out through the side face from the installation section by which installation immobilization is carried out, and a top face It is the package for solid state image sensor receipt which attaches the insulating frame which prevents that surround said installation section and an unnecessary light is irradiated by the solid state image sensor, and changes. The metallizing wiring layer put on said insulating base top face is a package for solid state image sensor receipt characterized by covering the insulator layer which changes from the same ingredient to the part in which an insulating frame is attached at least substantially with an insulating base.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the package for holding the solid state image sensor used for a video camera etc.

[0002]

[Description of the Prior Art] As the package for holding a solid state image sensor conventionally is shown in drawing 2 tungsten (W) which was missing from the base and was drawn from the crevice and this circumference of a crevice for consisting of electrical insulation materials, such as alumina ceramics, and holding a solid state image sensor in the abbreviation center section of the top face. The insulating base 11 which has the metallizing wiring layer 12 which consists of refractory metal powder, such as molybdenum (Mo). Much the external lead terminals 13 and sapphire which were attached in said metallizing wiring layer 12 through low material, such as silver solder, in order to connect a solid state image sensor to an external electrical circuit electrically. It consists of lids 14 which consist of translucency ingredients, such as glass, and each electrode of this solid state image sensor 15 is connected to the metallizing wiring layer 12 through a bonding wire 16 as if adhesion immobilization of the solid state image sensor 15 is carried out through a binder on the crevice base of an insulating base 11. After an appropriate time, Attachment junction of the translucency lid 14 is carried out with a sealing agent 17 in the upper part of an insulating base 11, and it becomes image pick-up equipment by closing a solid state image sensor 15 airtightly inside.

[0003] In addition, by connecting the external lead terminal 13 to an external electrical circuit, after holding a solid state image sensor 15 in the interior of a package airtightly, said conventional package for solid state image sensor receipt connects a solid state image sensor 15 to an external electrical circuit, and is a lens member (un-illustrating). Image formation of the reduced image is carried out on a solid state image sensor 15 through the light transmission ceramic lid 14, and it functions as image pick-up equipment of a video camera this by making a solid state image sensor 15 cause photo electric conversion.

[0004] However, when carrying out image formation of the image reduced by the lens member since the main surface area of the translucency lid 14 was large compared with the top-face area of a solid state image sensor 15 in this conventional package for solid state image sensor receipt to a solid state image sensor 15 through the translucency lid 14, Incidence of the unnecessary light is carried out to the interior of a package from parts other than the part where the solid state image sensor 15 of the translucency lid 14 counters. This carries out reflective propagation of the interior of a package, and he is a ghost (shadow) to a solid state image sensor 15. It had the fault of the ability not to make the good photo electric conversion for which forms, consequently it asks to a solid state image sensor 15 cause.

[0005] Then, in order to cancel the above-mentioned fault, a gobo 18 is arranged on the upper part in which the solid state image sensor 15 of said package for solid state image sensor receipt is attached, and while preventing that incidence of the unnecessary light is carried out to the interior of a package with this gobo 18, the package for solid state image sensor receipt made as [prevent / that a ghost is formed in a solid state image sensor 15 / effectively] is proposed.

[0006]

[Problem(s) to be Solved by the Invention] However, it sets in this conventional package for solid state image sensor receipt. The danger of contacting the bonding wire 16 by which some gobos 18 have connected electrically each electrode and the metallizing wiring layer 12 of a solid state image sensor 15 during the activity in case a gobo 18 is arranged on the upper part of a solid state image sensor 15 is high. Bonding wire 16 comrade whom the electrical installation of a bonding wire 16 and the metallizing wiring layer 12 goes out, or some gobos 18 adjoin had the fault that will carry out a contact short circuit and the function as image pick-up equipment will lose.

[0007] Moreover, although the gobo 18 is beforehand *****ed) to the insulating base 11 of a package and attaching a solid state image sensor 15 in the crevice base of an insulating base 11 after an appropriate time is also considered, if the gobo 18 is beforehand arranged on the insulating base 11, this gobo 18 will check junction to a solid state image sensor 15 and the metallizing wiring layer 12, and a bonding wire 16, and will induce the fault that electrical installation of each electrode of a solid state image sensor 15 cannot be carried out to the metallizing wiring layer 12 correctly and certainly.

[0008] Furthermore, it sets in this conventional package for solid state image sensor receipt. In order to prevent that incidence of the unnecessary light is carried out to the interior of a package, while preparing a gobo 18 separately, this gobo 18 is attached in the upper part of the crevice in which the solid state image sensor of a package is held, and if there is no ****, it will not become. While the member which constitutes a package increased, when manufacturing image pick-up equipment using this package, it also had the fault which the production process increases sharply, consequently makes very expensive the image pick-up equipment as a product.

[0009]

[Means for Solving the Problem] On the insulating base which has two or more metallizing wiring layers which a solid state image sensor applies to a base, and by which covering derivation was carried out through the side face from the installation section by which installation immobilization is carried out, and a top face, this invention It is the package for solid state image sensor receipt which attaches the insulating frame which prevents that surround said installation section and an unnecessary light is irradiated by the solid state image sensor, and changes. The metallizing wiring layer put on said insulating base top face is characterized by covering the insulator layer which changes from the same ingredient to the part in which an insulating frame is attached at least substantially with

an insulating base.

[0010]

[Example] Next, this invention is explained based on an accompanying drawing. Drawing 1 It is the sectional view showing one example of the package for solid state image sensor receipt of *****, and is 1. An insulating base and 2 An insulating frame and 3 It is a translucency lid.

[0011] Said insulating base 1 It consists of electrical insulation materials, such as alumina ceramics, and is a solid state image sensor 4 to the top-face center section. The installation section A by which installation immobilization is carried out It has and is this installation section A. Solid state image sensor 4 It is fixed through binders, such as organic resin.

[0012] said insulating base 1 An alumina (AL₂O₃), a silica (SiO₂), calcia (CaO), and magnesia (MgO) etc. — while carrying out addition mixing of the suitable organic solvent for raw material powder, and the solvent and fabricating this from a well-known press-forming method to tabular conventionally after an appropriate time — this tabular Plastic solid — elevated temperature (about 1600 degrees C) It is obtained by calcinating.

[0013] Said insulating base 1 It applies to a base through a side face again from the top face, and they are two or more metallizing wiring layers 5. Covering formation is carried out and it is this metallizing wiring layer 5. Insulating base 1 In the top-face section, it is a solid state image sensor 4. Each electrode is a bonding wire 6. It minds and connects and is the metallizing wiring layer 5. Insulating base 1 A bottom surface part is connected to an external electrical circuit through solder etc.

[0014] said metallizing wiring layer 5 the metal paste which consisted of refractory metal powder, such as a tungsten, molybdenum, and manganese, carried out addition mixing and obtained the suitable organic solvent for refractory metal powder, such as this tungsten, and the solvent — insulating base 1 this can be burned, while applying to a base from a top face and carrying out printing spreading with well-known screen printing conventionally — insulating base 1 From a top face, through a side face, it applies to a base and covering formation is carried out.

[0015] In addition, said metallizing 5 It is the metal of right conductivity excelling [and] in the corrosion resistance of nickel, gold, etc. at the outside surface to expose by plating 1.0 Or 20.0 micrometers When layer arrival is carried out to thickness, it is the metallizing wiring layer 5. While oxidization corrosion is prevented effectively, it is the metallizing wiring layer 5. Bonding wire 6 Junction and metallizing wiring layer 5 Connection with an external electrical circuit becomes very good. Therefore, metallizing wiring layer 5 It is the metal of right conductivity excelling [and] in the corrosion resistance of nickel, gold, etc. at the outside surface to expose by plating 1.0 Or 20.0 micrometers It is desirable to carry out layer arrival to thickness.

[0016] Moreover, said insulating base 1 is the insulating frame 2 later mentioned in the top-face periphery section. It is an insulator layer B to the part attached. It is covered and is this insulator layer B. Insulating base 1 Metallizing wiring layer 5 made to put on a top face It is the insulating frame 2 at least. The part attached is covered.

[0017] said insulator layer B Insulating base 1 substantial — the same ingredient (aluminum 2 O 3), for example, an alumina, it changes. etc. — from — Insulator layer B which consists of this alumina etc. Insulating base 1 since glass, resin, etc. and adhesion are good It is the insulating frame 2 upwards. Binder 7 which consists of glass, resin, etc. When making it mind and attach, Insulating base 1 Metallizing wiring layer 5 made to put upwards Binder 7 Insulator layer B which intervened between them Adhesion reinforcement becomes very strong. Consequently, insulating base 1 Metallizing wiring layer 5 made to put upwards Insulating frame 2 Poor junction hardly occurs in an attachment joint. It is a solid state image sensor 4 to the interior of a package. It makes it possible to hold airtightly and is a solid state image sensor 4. Normality and stability can be operated over a long period of time.

[0018] moreover, said insulator layer B Insulating base 1 Insulating base 1 since it consists of the same ingredient substantially Metallizing wiring layer 5 located in a base the heat for carrying out heating melting of the low material, in case it connects with an external electrical circuit through low material, such as solder, — insulating base 1 And insulator layer B ***** it is impressed — both coefficient of thermal expansion — abbreviation — it is the same and big thermal stress does not occur among both Therefore, insulating base 1 Insulator layer B It is the solid state image sensor 4 which it has no that exfoliation occurs with the thermal stress which originates in a difference of both coefficient of thermal expansion in between, makes the hermetic seal inside a package perfect also by this, and is held in the interior. Normality and stability can be operated over a long period of time.

[0019] In addition, said insulator layer B For example, insulating bases 1, such as an alumina, a silica, and a magnesia It is the metallizing wiring layer 5 about the insulating paste which carried out addition mixing and obtained the suitable organic solvent for the same ceramic raw material powder, and the solvent. Insulating base 1 which it has It is an insulating base 1 by carrying out printing spreading with well-known screen printing etc. conventionally on the top face at the shape of a frame, and calcinating this at an elevated temperature after an appropriate time. A top-face predetermined location is covered.

[0020] moreover, said insulator layer B the thickness — 5.0 Or 50.0 micrometers ** — if it carries out — metallizing wiring layer 5 Binder 7 adhesion reinforcement — very — strong — becoming — insulating frame 2 Insulating base 1 in order to turn attachment junction firmly up — metallizing wiring layer 5 Insulator layer B to cover thickness — 0.5 Or 50.0 micrometers ** — what is done is desirable.

[0021] said insulating base 1 **** — insulator layer B made to put on the top-face periphery section again a top — the insulating frame 2 — the solid state image sensor installation section A it attaches, as it surrounds — having — **** — this insulating frame 2 Translucency lid 3 Insulating base 1 It acts as supporter material for fixing with predetermined spacing.

[0022] In addition, said insulating frame 2 It is an insulating base 1 about the inferior surface of tongue. Binders 7, such as glass and resin It is minded and attached. Insulating frame 2 Adhesion is a solid state image sensor 4. Insulating frame 2 since it is carried out in the periphery section It is the insulating frame 2 at the time of adhesion. Solid state image sensor 4 Each electrode and metallizing wiring layer 5 Bonding wire 6 connected electrically It hardly contacts. It is a solid state image sensor 4 by this. Each electrode and metallizing wiring layer 5 Electrical installation can be made as it is [being correctness and] certain.

[0023] Moreover, said insulating frame 2 It consists of electrical insulation materials, such as alumina ceramics. Insulating base 1 The same approach (AL₂O₃), i.e., an alumina a silica (SiO₂), calcia (CaO), and magnesia (MgO) etc. — the suitable organic solvent for raw material powder — While carrying out addition mixing of the solvent and fabricating this in a predetermined configuration from a well-known press-forming method conventionally after an appropriate time, it is an elevated temperature (about 1600 degrees C) about this Plastic solid. It is obtained by calcinating.

[0024] said insulating base 1 Solid state image sensor 4 which has the flange 8 extended inside in the upper part again, prevents effectively that an unnecessary light carries out incidence of this flange 8 to the interior of a package, and is held in the interior by this

**** — ghost (shadow) being formed — almost — there is nothing — solid state image sensor 4 It becomes possible to make good photo electric conversion cause.

[0025] In addition, said insulating frame 2 It is a flange 8 to the upper part. The gobo for preventing the incidence of light, since it can prevent effectively that an unnecessary light carries out incidence to the interior of a package by preparing is prepared specially. It is a solid state image sensor 4 about this. It can also miniaturize and the need of allotting the upper part can also thin-shape-ize the image pick-up equipment of a product while it lessens the member which constitutes a package and makes the image pick-up equipment as a product with a very cheap thing by this absolutely none.

[0026] Moreover, said insulating frame 2 An unnecessary light by which incidence was carried out to the interior of a package when making the color black is the insulating frame 2. It being absorbed and carrying out reflective propagation of the interior of a package is the solid state image sensor 4 which it is effectively prevented, consequently is held in the interior. It can prevent further that a ghost is formed. Therefore, insulating frame 2 It is desirable to make the color black.

[0027] Furthermore, said insulating frame 2 Insulating frame 2 which will be later mentioned if the inferior surface of tongue and top face are made to the parallel field It is the translucency lid 3 to a top face. When it attaches, Translucency lid 3 A field and insulating base 1 Solid state image sensor 4 which carried out attachment immobilization on the top face It is the translucency lid 3 about the image which the top face became parallel and was reduced by the lens member (un-illustrating). It is a solid state image sensor 4 about an image exact as there being nothing about it being crooked and generating distortion. Image formation can be turned up. Therefore, insulating frame 2 It is desirable to process the top face and inferior surface of tongue on an parallel field.

[0028] Said insulating frame 2 It is the translucency lid 3 to the top face again. Binder 9 which consists of resin, glass, etc. It is minded and attached.

[0029] Said translucency lid 2 It consists of the ingredient of the translucency which may penetrate light, such as sapphire and glass, and is a lens member (un-illustrating). Solid state image sensor 4 which held the reduced image in the interior of a package It succeeds in the operation which turns incidence image formation up.

[0030] in addition, said translucency lid 2 for example, the case where it consists of glass — a silica (SiO_2), an alumina (aluminum 2 O 3), calcia (CaO), and barium oxide (BaO) etc. — while carrying out melting cooling of the glass component powder, it is formed by fabricating to plate-like.

[0031] According to the package for solid state image sensor receipt of this invention in this way, it is an insulating base 1. Solid state image sensor installation section A It is a solid state image sensor 4 upwards. While carrying out installation immobilization, it is the metallizing wiring layer 5 about each electrode of this solid state image sensor 4. Bonding wire 6 It minds and attaches. Next, insulating base 1 It is the insulating frame 2 to the top-face periphery section. Binder 7 While minding and attaching, it is this insulating frame 2. It is the translucency lid 3 to a top face. Binder 9 It minds and attaches and is a solid state image sensor 4. It becomes image pick-up equipment as a final product by holding in the interior airtightly.

[0032]

[Effect of the Invention] The gobo for preventing that an unnecessary light carries out incidence of incidence of the unnecessary light being carried out to the interior of a package by preparing a flange in an insulating frame according to the package for solid state image sensor receipt of this invention into a package since it made as [prevent / effectively] is prepared specially. Absolutely none, by this, the need of allotting this to the upper part of a solid state image sensor can lessen the member which constitutes a package, and can make the image pick-up equipment as a product with a very cheap thing.

[0033] Moreover, it also becomes possible to contact bonding WANYA to which this gobo has connected electrically each electrode and metallizing wiring layer of a solid state image sensor, since the gobo for preventing that an unnecessary light carries out incidence into a package is unnecessary, to cut the electrical installation of a bonding wire and a metallizing wiring layer, to hardly carry out the contact short circuit of the adjoining bonding wire comrade, consequently to carry out electrical installation of each electrode and metallizing wiring layer of a solid state image sensor correctly and certainly.

[0034] Furthermore, since intervened the insulating frame on the insulating base which has a metallizing wiring layer, the insulator layer was made to intervene in between and it attached, attachment junction of the insulating base which has a metallizing wiring layer, and the insulating frame can be carried out firmly, and it can become possible to hold a solid state image sensor in the interior of a package airtightly, and a solid state image sensor can be operated to normality and stability over a long period of time.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the sectional view showing one example of the package for solid state image sensor receipt of this invention.

[Drawing 2] It is the sectional view of the conventional package for solid state image sensor receipt.

[Description of Notations]

- 1 Insulating base
- 2 Insulating frame
- 3 Translucency lid
- 4 Solid state image sensor
- 5 Metallizing wiring layer
- A Solid state image sensor installation section
- B Insulator layer

[Translation done.]

(19)日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11)特許出願公開番号

特開平5-90548

(43)公開日 平成5年(1993)4月9日

(51) Int.Cl.⁵

H 0 1 L 27/14

23/02

識別記号

庁内整理番号

F 7220-4M

7210-4M

FI

H O I L 27/ 14

技術表示箇所

D

審査請求 未請求 請求項の数 1 (全 5 頁)

(21)出願番号

特願平3-249677

(22)出願日

平成3年(1991)9月27日

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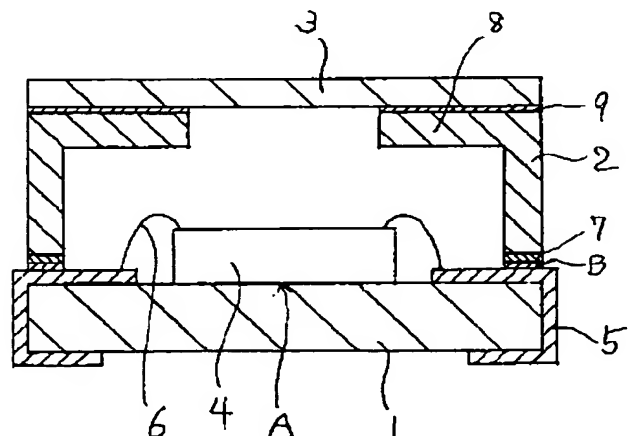
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(54)【発明の名称】 固体撮像素子収納用パッケージ

(57) 【要約】

【目的】パッケージ内部に不要な光の入射を有効に阻止し、固体撮像素子に長期間わたり良好な光電変換を起こさせることができる安価な固体撮像素子収納用パッケージを提供することにある。

【構成】固体撮像素子4が載置固定される載置部Aと上面から側面を介し底面にかけて被着導出された複数個のメタライズ配線層5を有する絶縁基体1上に、前記載置部Aを囲繞し、且つ固体撮像素子4に不要な光が照射されるのを防止する絶縁枠体2を取着して成る固体撮像素子収納用パッケージであって、前記絶縁基体1上面に被着されたメタライズ配線層5はその少なくとも絶縁枠体2の取着される部位に絶縁基体1と実質的に同一の材料から成る絶縁膜Bが被覆されている。絶縁基体1に絶縁枠体2が強固に取着されるとともに絶縁枠体2がパッケージ内に不要な光が入射されるのを有効に阻止する。



【特許請求の範囲】

【請求項1】固体撮像素子が載置固定される載置部と上面から側面を介し底面にかけて被着導出された複数個のメタライズ配線層を有する絶縁基体上に、前記載置部を囲繞し、且つ固体撮像素子に不要な光が照射されるのを防止する絶縁枠体を取着して成る固体撮像素子収納用パッケージであって、前記絶縁基体上面に被着されたメタライズ配線層はその少なくとも絶縁枠体の取着される部位に絶縁基体と実質的に同一の材料から成る絶縁膜が被覆されていることを特徴とする固体撮像素子収納用パッケージ。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明はビデオカメラ等に使用される固体撮像素子を収容するためのパッケージに関するものである。

【0002】

【従来の技術】従来、固体撮像素子を収容するためのパッケージは図2に示すように、アルミナセラムックス等の電気絶縁材料から成り、その上面の略中央部に固体撮像素子を収容するための凹部及び該凹部周辺から底面にかけて導出されたタングステン(W)、モリブデン(Mo)等の高融点金属粉末から成るメタライズ配線層12を有する絶縁基体11と、固体撮像素子を外部電気回路に電気的に接続するために前記メタライズ配線層12に銀ロウ等のロウ材を介し取着された多数の外部リード端子13とサファイヤ、ガラス等の透光性材料から成る蓋体14とから構成されており、絶縁基体11の凹部底面に固体撮像素子15を接着材を介して接着固定するとともに該固体撮像素子15の各電極をボンディングワイヤ16を介してメタライズ配線層12に接続させ、しかる後、絶縁基体11の上部に透光性蓋体14を封止材17により取着接合し、固体撮像素子15を内部に気密に封止することによって撮像装置となる。

【0003】尚、前記従来の固体撮像素子収納用パッケージはパッケージ内部に固体撮像素子15を気密に収容した後、外部リード端子13を外部電気回路に接続することによって固体撮像素子15を外部電気回路に接続し、レンズ部材(不図示)により縮小された像を透光セラムックス蓋体14を介し固体撮像素子15上に結像させ、固体撮像素子15に光電変換を起こさせることによってビデオカメラ当の撮像装置として機能する。

【0004】しかしながら、この従来の固体撮像素子収納用パッケージにおいては透光性蓋体14の主表面積が固体撮像素子15の上面面積に比べて大きいことからレンズ部材により縮小された像を透光性蓋体14を介して固体撮像素子15に結像させる際、透光性蓋体14の固体撮像素子15が対向する部位以外の部分からパッケージ内部に不要な光が入射され、これがパッケージ内部を反射伝搬して固体撮像素子15にゴースト(影)を形成し、その結果、固体撮像素子15に所望する良好な光電変換を起こさせる

ことができないという欠点を有していた。

【0005】そこで上記欠点を解消するために前記固体撮像素子収納用パッケージの固体撮像素子15が取着される上部に遮光板18を配し、該遮光板18によってパッケージ内部に不要な光が入射されるのを阻止するとともに固体撮像素子15にゴーストが形成されるのを有効に防止するようにした固体撮像素子収納用パッケージが提案されている。

【0006】

【発明が解決しようとする課題】しかしながら、この従来の固体撮像素子収納用パッケージにおいては、固体撮像素子15の上部に遮光板18を配する際、その作業中に遮光板18の一部が固体撮像素子15の各電極とメタライズ配線層12とを電気的に接続しているボンディングワイヤ16に接触する危険性が高く、遮光板18の一部がボンディングワイヤ16とメタライズ配線層12との電気的接続が切れたり、隣接するボンディングワイヤ16同志が接触短絡したりして撮像装置としての機能が喪失してしまうという欠点を有していた。

【0007】またパッケージの絶縁基体11に予め遮光板18を取着配しておき、しかる後、固体撮像素子15を絶縁基体11の凹部底面に取着することも考えられるが絶縁基体11に予め遮光板18を配しておくこと該遮光板18が固体撮像素子15及びメタライズ配線層12とボンディングワイヤ16との接合を阻害し、固体撮像素子15の各電極をメタライズ配線層12に正確、且つ確実に電気的接続することができないという欠点を誘発してしまう。

【0008】更にこの従来の固体撮像素子収納用パッケージにおいては、パッケージ内部に不要な光が入射されるのを阻止するために遮光板18を別途準備するとともに該遮光板18をパッケージの固体撮像素子を収容する凹部の上部に取着し配さなければならず、パッケージを構成する部材が多くなるとともに該パッケージを用いて撮像装置を製造する際、その製造工程が大幅に増大してしまい、その結果、製品としての撮像装置を極めて高価とする欠点も有していた。

【0009】

【課題を解決するための手段】本発明は固体撮像素子が載置固定される載置部と上面から側面を介し底面にかけて被着導出された複数個のメタライズ配線層を有する絶縁基体上に、前記載置部を囲繞し、且つ固体撮像素子に不要な光が照射されるのを防止する絶縁枠体を取着して成る固体撮像素子収納用パッケージであって、前記絶縁基体上面に被着されたメタライズ配線層はその少なくとも絶縁枠体の取着される部位に絶縁基体と実質的に同一の材料から成る絶縁膜が被覆されていることを特徴とするものである。

【0010】

【実施例】次に本発明を添付図面に基づき説明する。図1は本発明の固体撮像素子収納用パッケージの一実施例

を示す断面図であり、1 は絶縁基体、2 は絶縁枠体、3 は透光性蓋体である。

【0011】前記絶縁基体1 はアルミナセラミックス等の電気絶縁材料から成り、その上面中央部に固体撮像素子4 が載置固定される載置部A を有し、該載置部A に固体撮像素子4 が有機樹脂等の接着材を介し固定される。

【0012】前記絶縁基体1 はアルミナ (Al_2O_3)、シリカ (SiO_2)、カルシア (CaO)、マグネシア (MgO) 等の原料粉末に適当な有機溶剤、溶媒を添加混合し、しかる後、これを従来周知のプレス成形法より板状に成形するとともに該板状成形体を高温 (約1600℃) で焼成することによって得られる。

【0013】前記絶縁基体1 はまたその上面から側面を介し底面にかけて複数個のメタライズ配線層5 が被着形成されており、該メタライズ配線層5 の絶縁基体1 上面部には固体撮像素子4 の各電極がボンディングワイヤ6 を介し接続され、またメタライズ配線層5 の絶縁基体1 底面部は外部電気回路に半田等を介して接続される。

【0014】前記メタライズ配線層5 はタングステン、モリブデン、マンガン等の高融点金属粉末から成り、該タングステン等の高融点金属粉末に適当な有機溶剤、溶媒を添加混合して得た金属ペーストを絶縁基体1 の上面から底面にかけて従来周知のスクリーン印刷法により印刷塗布するとともにこれを焼き付けることによって絶縁基体1 の上面から側面を介し底面にかけて被着形成される。

【0015】尚、前記メタライズ5 はその露出する外表面にニッケル、金等の耐蝕性に優れ、且つ良導電性の金属をメッキにより1.0 乃至20.0 μm の厚みに層着させておくこととメタライズ配線層5 の酸化腐食が有効に防止されるとともにメタライズ配線層5 へのボンディングワイヤ6 の接合及びメタライズ配線層5 の外部電気回路への接続が極めて良好となる。従って、メタライズ配線層5 の露出する外表面にはニッケル、金等の耐蝕性に優れ、且つ良導電性の金属をメッキにより1.0 乃至20.0 μm の厚みに層着させておくことが好ましい。

【0016】また前記絶縁基体1 はその上面外周部で後述する絶縁枠体2 が取着される部位に絶縁膜B が被着されており、該絶縁膜B は絶縁基体1 上面に被着させたメタライズ配線層5 の少なくとも絶縁枠体2 が取着される部位を被覆している。

【0017】前記絶縁膜B は絶縁基体1 と実質的に同一の材料、例えばアルミナ (Al_2O_3) 等から成り、該アルミナ等から成る絶縁膜B はガラスや樹脂等と密着性が良いことから絶縁基体1 上に絶縁枠体2 をガラスや樹脂等から成る接着材7 を介して取着させる際、絶縁基体1 上に被着させたメタライズ配線層5 と接着材7 とはその間に介在された絶縁膜B によって密着強度が極めて強いもとなり、その結果、絶縁基体1 上に被着させたメタライズ配線層5 と絶縁枠体2 との取着接合部に接合不良が

発生することは殆どなく、パッケージ内部に固体撮像素子4 を気密に収容するのを可能として固体撮像素子4 を長期間にわたり正常、且つ安定に作動させることができる。

【0018】また前記絶縁膜B は絶縁基体1 と実質的に同一の材料より成ることから絶縁基体1 底面に位置するメタライズ配線層5 を外部電気回路に半田等のロウ材を介して接続する際、ロウ材を加熱溶融させるための熱が絶縁基体1 及び絶縁膜B に印加されたとしても両者の熱膨張係数は略同一であり、両者間に大きな熱応力が発生することはない。従って、絶縁基体1 と絶縁膜B との間に両者の熱膨張係数の相違に起因する熱応力によって剥離が発生することは皆無であり、これによってもパッケージ内部の気密封止を完全とし、内部に収容する固体撮像素子4 を長期間にわたり正常、且つ安定に作動させることができる。

【0019】尚、前記絶縁膜B は例えば、アルミナ、シリカ、マグネシア等の絶縁基体1 と同様のセラミック原料粉末に適当な有機溶剤、溶媒を添加混合して得た絶縁ペーストをメタライズ配線層5 を有する絶縁基体1 の上面に従来周知のスクリーン印刷法等により枠状に印刷塗布し、しかる後、これを高温で焼成することによって絶縁基体1 の上面所定位置に被着される。

【0020】また前記絶縁膜B はその厚みを5.0 乃至50.0 μm としておくこととメタライズ配線層5 と接着材7 との密着強度が極めて強くなり、絶縁枠体2 を絶縁基体1 上に強固に取着接合させるためにはメタライズ配線層5 を被覆する絶縁膜B の厚みを0.5 乃至50.0 μm としておくことが好ましい。

【0021】前記絶縁基体1 にはまたその上面外周部に被着させた絶縁膜B 上に絶縁枠体2 が固体撮像素子載置部A を囲繞するようにして取着されており、該絶縁枠体2 は透光性蓋体3 を絶縁基体1 より所定の間隔をもって固定するための支持部材として作用する。

【0022】尚、前記絶縁枠体2 はその下面を絶縁基体1 にガラス、樹脂等の接着材7 を介して取着され、絶縁枠体2 の接着が固体撮像素子4 の外周部において行われることから絶縁枠体2 の接着時に絶縁枠体2 が固体撮像素子4 の各電極とメタライズ配線層5 とを電気的に接続するボンディングワイヤ6 に接触することは殆どなく、これによって固体撮像素子4 の各電極とメタライズ配線層5 との電気的接続を正確、且つ確実にすることができ

る。

【0023】また前記絶縁枠体2 はアルミナセラミックス等の電気絶縁材料から成り、絶縁基体1 と同様の方法、即ち、アルミナ (Al_2O_3)、シリカ (SiO_2)、カルシア (CaO)、マグネシア (MgO) 等の原料粉末に適当な有機溶剤、溶媒を添加混合し、しかる後、これを従来周知のプレス成形法より所定形状に成形するとともに該成形体を高温 (約1600℃) で焼成することによって得られ

る。

【0024】前記絶縁基体1 はまたその上部に内側に伸びる鍔部8を有しており、該鍔部8はパッケージ内部に不要な光が入射するのを有効に阻止し、これによって内部に収容する固体撮像素子4 にはゴースト(影) が形成されることは殆どなく、固体撮像素子4 に良好な光電変換を起こさせることが可能となる。

【0025】尚、前記絶縁枠体2 はその上部に鍔部8 を設けておくことによってパッケージ内部に不要な光が入射するのを有効に阻止することができることから光の入射を阻止するための遮光板をわざわざ準備し、これを固体撮像素子4 の上部に配する必要は一切なく、これによってパッケージを構成する部材を少なくし、製品としての撮像装置を極めて安価なものとなすとともに製品としての撮像装置を小型化、薄型化することもできる。

【0026】また前記絶縁枠体2 の色を黒色にしておけばパッケージ内部に入射された不要な光は絶縁枠体2 に吸収されてパッケージ内部を反射伝搬するのが有効に阻止され、その結果、内部に収容する固体撮像素子4 にゴーストが形成されるのをより一層防止することができる。従って、絶縁枠体2 はその色を黒色にしておくことが好ましい。

【0027】更に前記絶縁枠体2 はその下面と上面とを平行な面になしておくことと後述する絶縁枠体2 の上面に透光性蓋体3 を取着した際、透光性蓋体3 の面と絶縁基体1 上面に取着固定した固体撮像素子4 の上面とが平行となり、レンズ部材(不図示) で縮小された像を透光性蓋体3 で屈曲され、歪みを発生するのを皆無として正確な像を固体撮像素子4 上に結像させることができる。従って、絶縁枠体2 はその上面と下面とを平行な面に加工しておくことが好ましい。

【0028】前記絶縁枠体2 はまたその上面に透光性蓋体3 が樹脂やガラス等から成る接着材9 を介して取着される。

【0029】前記透光性蓋体2 はサファイヤやガラス等の光を透過し得る透光性の材料より成り、レンズ部材(不図示) で縮小された像をパッケージの内部に収容した固体撮像素子4 上に入射結像させる作用を為す。

【0030】尚、前記透光性蓋体2 は、例えばガラスから成る場合、シリカ(SiO_2)、アルミナ(Al_2O_3)、カルシア(CaO)、酸化バリウム(BaO)等のガラス成分粉末を溶融冷却するとともに平板状に成形することによって形成される。

【0031】かくして本発明の固体撮像素子収納用パッケージによれば、絶縁基体1 の固体撮像素子載置部A 上

に固体撮像素子4 を載置固定するとともに該固体撮像素子4の各電極をメタライズ配線層5 にボンディングワイヤ6 を介して取着し、次に絶縁基体1 の上面外周部に絶縁枠体2 を接着材7 を介して取着するとともに該絶縁枠体2 の上面に透光性蓋体3 を接着材9 を介して取着し、固体撮像素子4 を内部に気密に収容することによって最終製品としての撮像装置となる。

【0032】

【発明の効果】本発明の固体撮像素子収納用パッケージによれば絶縁枠体に鍔部を設けることによってパッケージ内部に不要な光が入射されるのを有効に阻止することになったことからパッケージ内に不要な光が入射するのを阻止するための遮光板をわざわざ準備し、これを固体撮像素子の上部に配する必要は一切なく、これによってパッケージを構成する部材を少なくし、製品としての撮像装置を極めて安価なものとなすことができる。

【0033】またパッケージ内に不要な光が入射するのを阻止するための遮光板が不要なことから該遮光板が固体撮像素子の各電極とメタライズ配線層とを電氣的に接続しているボンディングワイヤに接触し、ボンディングワイヤとメタライズ配線層との電氣的接続を切ったり、隣接するボンディングワイヤ同志を接触短絡させたりすることは殆どなく、その結果、固体撮像素子の各電極とメタライズ配線層とを正確、且つ確実に電氣的接続することも可能となる。

【0034】更にメタライズ配線層を有する絶縁基体上に絶縁枠体を間に絶縁膜を介在させて取着したことからメタライズ配線層を有する絶縁基体と絶縁枠体とを強固に取着接合させることができ、パッケージ内部に固体撮像素子を気密に収容するのが可能となって固体撮像素子を長期間にわたり正常、且つ安定に作動させることができる。

【図面の簡単な説明】

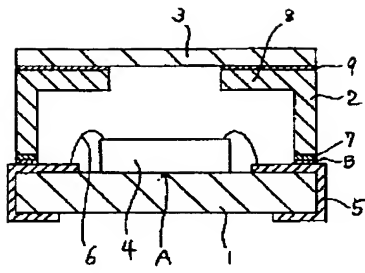
【図1】本発明の固体撮像素子収納用パッケージの一実施例を示す断面図である。

【図2】従来の固体撮像素子収納用パッケージの断面図である。

【符号の説明】

- 1 絶縁基体
- 2 絶縁枠体
- 3 透光性蓋体
- 4 固体撮像素子
- 5 メタライズ配線層
- A 固体撮像素子載置部
- B 絶縁膜

【図 1】



【図 2】

